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AUTHOR Sterling, C. H.
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ABSTRACT

The second educational technology review panel addressed problems with forecasting the trends and impact of newer telecomunications technologies in both home and institution of higher education settings, and the role of several grant programs in educational technology. Paul Mertins provided an update on a National Center for Education Statistics computer literacy project, and Peter Dirr and David LeRoy discussed a forthcoming Corporation for Public Broadcasting (CPB) survey. A panel on forecasting the telecommunications market included John Carey, New York University; Kathleen Criner, American Newspaper Publishers Association; Paige Everhart, Hope Reports; Harold Horowitz, National Endowment for the Arts (NEA); Charles Jones, IBM; Dana Kadison, independent consultant formerly with Warner/Atari; Charlotte LeGates, Computer and Business Manufacturers Association; and Charles Oliver, CBS, Inc. Educational administrators' need for knowledge of the potential of new delivery systems was addressed by Marc Tucker of the Carnegie-sponsored Project on Information Technology and Education, Charles Jones of IBM, and John Robinson of the University of Maryland. Participants in the final panel discussion on grant programs in media and educational technologies were Steve Ehrmann, Fund for the Improvement of Post-Secondary Education; Dick Humber and Grace Cavallari, National Endowment for the Humanities; Peter Dirr and Mara Mayor, CPB; and Harold Horowitz, NEA. Final comments concerned funding programs and ideas for future panel meetings. (LMM)

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TRACKING THE NEW TECHNOLOGY

A Summary of the Second Invitational Postsecondary Educational Review Panel

August 17, 1983

prepared by:

C.H. Sterling
Director
Center for Telecommunications Studies
Division of Continuing Education
The George Washington University
Washington, D.C. 20052
(202)676-7062

prepared for:

National Center for Education Statistics
U.S. Department of Education

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Introduction

The second educational technology review panel met on Wednesday, August 17, 1983, as part of a series of meetings sponsored by the Department of Education's National Center for Education Statistics, and George Washington University's Center for Telecommunications Studies. The session was called to discuss two subjects: problems with forecasting the trends and impact of newer telecommunications technologies in both home and institutional settings of higher education, and the role of several selected grant programs in educational technology. Both portions of the meeting were intended to provide insight into both ongoing and still-needed ways of assessing the educational impact of the increasing menu of technologies potentially applicable to post-secondary education efforts.

After a brief welcome by Christopher Sterling, the panel moderator (and director of the GWU Center), Paul Mertins of the Learning Resources Branch of NCES provided an update on the NCES-sponsored project on computer literacy, one purpose of which is to develop an adequate working definition of the term. In addition, the study aims at creating an "item bank" of measures of computer literacy for practical application by superintendents, principals, teachers, and students.

CPB Home Telecommunications Survey

Peter Dirr of the Corporation for Public Broadcasting, and Dr. David LeRoy, a consultant working with CPB, led off the morning session with the forthcoming CPB survey of telecommunications in the home, a study supported by NCES. Dirr began with background on several related past CPB-NCES projects, most of which focused on direct applications of public broadcasting (especially television) content to post-secondary education. All have been designed to measure uses of public broadcasting in institutional settings at different times and under different constraints so as to plot trends in recent years. The forthcoming survey is an expansion of this past effort by dealing with the very beginning of new telecommunications technology penetration into individual homes, rather than institutional settings.

The study is in the design stage and involves a number of methodological problems--chief among them, is whether one or more different approaches should be used depending on the different levels of home penetration by different technologies. In addition, the survey is essentially a search for "indicators," or statistically valid measures of penetration and other factors, useful for prediction of future trends. The initial stage of the research included a literature review of some 2,000 studies, most of which were largely repetitive.

One subject about which we know remarkably little thus far is what LeRoy termed "demographic determinism," or <u>why</u> any specific person (or kind of person--representative of some given societal subgroup) decides to buy or use a given means of telecommunication. Different people clearly have different needs and backgrounds, but just how these interact in the process of using telecommunications (among other things) is barely known. Some software, for example, is technology driven, while some is

more widely held (the software for simple calculators is in all of our heads). The target audience of most interst to this upcoming survey is adults 25 and older who are now unlikely to pursue a college degree and are thus especially open to educational efforts by other "nontraditional" means. And there has been a substantial shift of population to that age group in recent years, as LeRoy documented with a handout.

Forecasting the Market for Telecommunications

The day's largest and longest panel provided a variety of points of view on the problems and prospects of accurate predictions of telecommunications technology. It began with New York University's John Carey discussing some of the problems with the many forecasts we read:

- how estimates are derived is seldom made clear;
- things are moving too fast, and there are too many unknown factors to allow accurate surveys;
- assumptions, limits, and biases of surveys or estimates are seldom clarified;
- there is too little interpretation of what data does exist--there is need for analysis even beyond what data supports if only to give hints of new ways of looking at things;
- at the same time, we have an inadequate grasp of past trends to better interpret current developments; and
- there are insufficient accurate case studies to shed light on larger developments.

Carey then outlined his own current CPB-sponsored research applying conservative techniques to a comparison of old and current media-use patterns. Questions that he posed to use include: are there "technology walls" which somehow limit how far a new technology will penetrate? Are there cycles in trends or fads--he cited the recent come-back of 3-D films in theaters, and the rising interest once again in videoconferencing as two examples. And are some technologies replaced, as seems the case with CB radio (other than with truckers) and many videogames, as newer technologies come along. In all, Carey suggests we need to develop analogs and metaphors to more accurately "contextualize" current developments in technology with past trends.

Kathleen Criner of the American Newspaper Publishers Association telecommunications office outlined newspaper interest in new technologies--especial the economic viability of such services for papers of varied circulation size. In other words, the key question for any commercial firm is: Is there really a market for any of these potential services? Driving this concern for ANPA members is the relatively flat circulation picture and the rising costs of energy in the face of declining electronic delivery costs. Criner provided a number of specific examples of "scrolling" news services on cable, other local video programming, and experiments in the new video text options--noting that what is known of the market for many of these, especially the latter, is unfortunately of a proprietary nature. With a concern for education, she noted that the Association for Education in Journalism is surveying member colleges on courses, research, and actual applications of new media in journalism schools.

Paige Everhart of Hope Reports briefly described market factors of several instructional technologies. She noted the audio-visual market

is still dominated by such relatively simple technologies as slides and tape. Too many of the highly touted new services have prices limiting their application to businesses--at least for the present.

Harold Horowitz, research director for the National Endowment for the Arts, and the U.S. representative on a world-wide UNESCO effort to develop accurate communications indicators, oulined that project's progress to date. Including statistical measures of all aspects of a nation's culture, Horowitz and several colleagues overseas are concentrating on media material. They are assessing what is now known and available to better define what research is still needed. There is a good deal of attention paid here to content categories and precise definition of terms to allow cross-cultural comparisons of some validity.

Charles Jones, representing the academic work station section of IBM, dealt with campus computing trends and needs. Among the latter: better printing at lower cost, development of local area networks (LANs) and the required access protocols, more compatibility across technologies, more use of private branch exchanges (PBXs), wider application of voice inputs and outputs, and development and study of some true campus-wide basic backbone networks. There are, effectively, no technical standards today to allow much of this, thus limiting ability of campus systems to provide bridges and/or gateways to other networks. Also needed: vastly improved network management.

Independent consultant Dana Kadison, formerly with Warner/Atari, described in electronic classroom experiment run in conjunction with the Columbus, Ohio, "Qube" cable system. Warner produced a non-credit course in business writing offered by the Columbus Technical Institute using 16 taped classes and 4 live and interactive sessions. The college considered the series a success given the new students reached--but the Warner people noted the very low demand for the live and interactive feature (a finding parallel to declining subscriber use of the interactive features of Qube generally in Columbus), and the relatively low number of people reached given the costs incurred. Among problem areas with things of this kind are: how to highlight such offerings in program guides filled with entertainment programs; the rental vs. purchase problem with related program tapes; the disinterest of commercial firsm in some kinds of institutional distribution; and difficulties with course "tie-ins," like books and other materials. While Kadison feels that cable has strong possibilities in this area, she was somewhat disillusioned by her experience with this experiment.

Charlotte LeGates, representing the Computer and Business Manufacturers Assocation, provided some background on her trade association noting three of its roles: instituting standards, providing an industry market databook, and attempting to forecast the computer/communications market. Echoing IBM's Jones, she felt specifically that the potential of LANs is being ignored in too many cases of system rebuilds and at new institutions. She spoke in addition of the value of the developing concept of Integrated Services Digital Networks (ISDN). She concluded with comments on the potential impact of current telephone legislation on campus and other non-profit users of LANs as bypass technologies.

The final panel speaker was Charles Oliver of CBS, Inc., who spoke primarily about current developments in the Instructional Television Fixed Service (ITFS), especially with regard to possible cooperative work with local commercial Multipoint Distribution Service (MDS) operators. He noted the value of entertainment (MDS) in getting receiver capability into people's homes for possible educational (ITFS) use, given that the two services share contiguous spectrum space, and both require heretofore expensive downconverter reception equipment. The demand for entertainment will bring down the cost of such downconverters much more rapidly than would be the case if ITFS tried to increase penetration alone. Finally, Oliver suggested serious consideration of videotape machines rather than spectrum-using services (ITFS, public television stations) for delivery of instructional material--as such would be cheaper and more time-efficient for educators.

Prior to a lunch break, the meeting involved a wide-ranging discussion of the points raised--and others. There was general agreement on the lack of sufficient knowledge among higher education administrators about the potential of the systems discussed here--and of some policy and other threats to that potential. ITFS was criticized for being in most cases too narrow a service--lacking sufficient appeal to enoough people to be economically viable even in a non-profit setting. Some, indeed, contended that public television delivery of instructional material, as well as ITFS services, was really part of the "old" and declining technology, not nearly as potentially cost-effective as the systems discussed here. Again and again, reference was made to the lack of research and thus understanding, of such new technology aspects as interactive communication. Also, there is clearly a problem of excessive specialization, both in hardware use and software design, that is harming a search for lower costs, and thus, wider option. Just before the break, Sterling posed the general question, "What do we <u>know</u>, and what do we <u>need</u> to know, to better analyze the potential of the plethora of new and changing technologies in delivery of postsecondary education?"

After lunch Marc Tucker, of the Carnegie-sponsored Project on Information Technology and Education, addressed Sterling's question at some length. He noted the rise among educational administrators in thinking about education as a business--a trend not obvious even a few years ago. In other words, there is clearly now considerable interest in how to package things for potential consumers ("students," though increasingly they are nontraditional in age and background) in cost-effective fashion. A sense of likely viability is now required to prior to large scale upfront investments in facilities, software, and people. Perhaps the key problem is that at home, in school, and at work, we all organize ourselves around the familiar: the world of paper, typewriter, file cabinet, and telephone. No one really wants to move away from that until we can really totally replace the "old" with the new . . . otherwise we have to learn to effectively use two systems. One likely result of the obviously already-present trend to more computer use and computer education in schools is that homes will contain not full compputers but, rather, terminals able to link with campus-based mainframes. Indeed, it could be in the interest of banks and others to literally give away terminals assuming possible bank uses (checking, savings, etc.) and profit as well. Children presently learning to live with and apply

computers will pace this coming change. Postsecondary education, as currently and traditionally structured, is clearly less and less cost-effective in this context. But it may be changing with rising concern about work-related education and training. Support for postsecondary education will certainly increase with the potential return on investment for both workers and employers of this kind of work-related education.

IBM's Charles Jones added that what the university is willing to pay for new systems and their potential is a key to predicting what will happen. Assigning value to given functions (whether computers or other technologies) is crucial. Further, the relation between home and institutional higher education is inadequately understood and researched. Vendors (including IBM) can likely help best by offering services and products to higher education institutions, helping the latter at the same time to work out answers to the questions above.

The University of Maryland's John Robinson, a sociologist with extensive research background in leisure-time use, suggested that there is a large lack of data and knowledge about technology and education, and the knowledge gap may be widening between those with technology assisted education, and those without. Much of the research we do have is short term; and, though most is in schools and factories, in point of fact, there is often more technology already in the home. However, we know little of what happens to technology in the home: who uses it? for what purpose? and for how long? This echoes LeRoy's point at the beginning of the day. Among other unknowns are the actual barriers to education and information flow in society, including time conflicts and the generally busy environmental nature of life today. Finally, with or without technology, Robinson suggests that we know too little about the incentives to learn.

A considerable discussion ensued before the final panel session. Among subjects raised were concerns about the differences between education and training; the competition facing colleges and universities as technology moves training needs into other institutions (office, factory, etc.); the need to understand the difference between being "tool poor" as opposed to "information poor" (much of the day's discussion having been about proper application in higher education of tools, beginning simply with access to the right tools); and a concern that conventional/traditional classrooms in being tool poor are sterile.

Selected Grant Programs

The final panel discussion of the day concerned selected grant programs in media and educational technology, with representatives from four such programs speaking with us. A number of others were not present, due mainly to the time of year that this panel was held. (National Science Foundation was one, although they are completing the work in most related funding).

Steve Ehrmann, of the Fund for the Improvement of Post-Secondary Education (FIPSE) in the Department of Education, described the kinds of work covered by his $12 million per year operation. The direction of FIPSE at any one time is set largely by the kinds of funding requests from the non-profit sector that FIPSE supports. Thousands are received,

but only 164 were awarded last year. (Of 800 applications on computers, for example, only 12 were funded). A key deciding point is whether or no. the proposal provides incremental insights into the educational process. Technological applications per se are never sufficient. For example, a typing course is unimportant in itself except that, as a tool, it may cause us to think and analyze differently, as one can generally type faster than write. Of the several funded projects that he noted, all were interdisciplinary in nature, and they dealt with new kinds of learning, and new approaches to older ideas. FIPSE is interested in faculty and curriculum development in fast-changing areas. He expressed concern about the lack of proposals coming in on questions of privacy and ownership incentives in educational developments. FIPSE guidelines are now being rewritten and will include a section on technology.

Representing the National Endowment for the Humanities were Dick Humber and Grace Cavallari. They reported that new guidelines had just been issued for the Media Program, stressing three goals: appreciation and interpretation of cultural works; illumination of historical ideas, figures and events; and understanding the discipline of the humanities. In evaluating a proposal, NEH considers its importance to the humanities, whether it is of interest to a large national audience, the tie provided between scholars and professionals, and the likely shelf life of the proposed product. Project funding varies greatly from grants of $15,000 or so for project planning, to $35-50,00 for a treatment or full script, up to $100,000 and more for actual production. A total of $10,000,000 was awarded in grants in 1983.

Peter Dirr and Mara Mayor provided the panel with details on the second year of the Annenberg-CPB project which funds projects developing new ways to apply technology to higher education. The project funds demonstrations and materials in several categories: seeking educational quality improvement through application of technology; explorations of delivery/access/flexibility through innovative use of technology; and related administrative or support services. Mayor and Dirr both commented that, thus far, too many proposals contain duplication of previous efforts instead of really path-breaking ideas, the real purpose of the program. Important in consideration of grant requests are: the general concept, the track record of the applicant, collaboration across fields and disciplines of the research team, real innovation in ideas, and evidence that the product will actually be used. Last year--the first--23 projects were funded. Thus far this year, some 263 proposals have come in. There is a strong need to pull thinking about content and technology closer together--too many proposals, both last year and this, were technology emphatic and almost content-free.

Harold Horowitz represented the National Endowment for the Arts (though his own work is research, not funding administration) by providing copies of relevant documents from NEA. The NEA Media Arts Program has been getting more complex over the years and now funds projects in several categories. There is a special interest at the moment in film preservation techniques.

Conclusion

The last half hour or so of conversation among panelists combined comments on the final panel (funding programs) with ideas for future NCES-CTS panel meetings. With the next panel tentatively scheduled for November 9, 1983, the following topics were suggested for discussion:

- the role of the military in funding research and projects dealing with education on the postsecondary level, especially those applying telecommunications technology one way or another. Naval Personnel Research and Development (San Diego), several divisions of the Army and Air Force all have relevant programs, most of them dealing with basic skills training (where, for example, there has been useful work with interactive video-discs). Marc Tucker volunteered to get us some contacts for a possible panel, all present agreeing that there is too little knowledge among civilian agencies and researchers of what the military are doing in this area.
- barriers to extended or continued use of materials produced under one or more grant programs. John Carey raised this matter of rights and clearances, relating especially to copyright limits. Cable companies have expressed interest in using some materials, but there has often been confusion over just who has the rights to any given program or series. There was some extended discussion of the policies of the agencies represented, some of which appeared to have clear policy, but several of which did not. It was agreed that a generic discussion of copyright and related rights questions would be of considerable value. A commissioned position paper was suggested.
- the long-existing problem area of distribution arose: How best to get broader circulation of materials once they are produced. What is the effective role of the educator and media producer as brokers in marketplace? What mechanisms exist? Is cable television an effective outlet? Where does one find information?
- another long-existing question for researchers, in this and other areas, which came up was: How do we find out what is now being done in any of these areas? Who is researching what? Who is funding what? Is there any kind of clearinghouse available in educational technology in addition to the ERIC program?
- there is need for some widely disseminated, accurate case studies of how technologies have been valuable in postsecondary education. Analysis across those cases, pointing out promising directions, is especially valuable.
- Briefly touched on here, and raised earlier in CTS-NCES planning meetings, is the issue of adequate teacher training and preparation for use of the various new telecommunications technologies. Educating (if that's the word!) traditional classroom teachers in effective use of television, or other media or delivery systems, and the matter of rights in such teaching, need to be explored.